

11. (New) The layer as claimed in claim 9, wherein the thickness of the layer is between 1 pm and 50 μ m.

12. (New) The layer as claimed in claim 9, wherein the thickness of the layer is between 5 pm and 15 pm.

13. (New) The layer as claimed in claim 9, wherein the BET surface area of the powder is between 5 and 500 m^2/g .

14. (New) The layer as claimed in claim 9, wherein said silicon/titanium mixed oxide powder is a mixture of powders comprising at least one powder having a BET surface area of at least 130 m^2/g and at least one powder having a BET surface area of at most 90 m^2/g , wherein the ratio by weight of the powders with a lower BET to the powders with a higher BET surface area is between 40:60 and 99.5:0.5.

15. (New) The layer as claimed in claim 14, wherein said silicon/titanium mixed oxide powder is a mixture of powders comprising at least one powder having a BET surface area of at least 170 m^2/g and at least one powder having a BET surface area of at most 70 m^2/g , wherein the ratio by weight of the powders with a lower BET to the powders with a higher BET surface area is between 40:60 and 99.5:0.5.

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16. (New) The layer as claimed in claim 9, wherein the substrate is selected from the group consisting of borosilicate glass, silica glass, glass ceramic, and a material with a very low coefficient of expansion.

17. (New) The layer as claimed in claim 9, further comprising less than 0.5 wt.% of impurities.

18. (New) A process for preparing the layer as claimed in claim 9, comprising applying a dispersion containing a silicon/titanium mixed oxide powder to a substrate, and thermal treatment sintering the dispersion applied to the substrate.

19. (New) The process as claimed in claim 18, further comprising preparing the dispersion by flame hydrolyzing a silicon/titanium mixed oxide powder, wherein the proportion of powder is between 0.1 and 60 wt.% in the dispersion.

20. (New) A method comprising coating a material with a layer as claimed in claim 9, wherein said material is selected from the group consisting of an ultra-low expansion material a photocatalytic material, a self-cleaning mirror, a superhydrophilic constituent, a lens, a container for a gas and a container for a liquid.

21. (New) A layer, wherein the layer is obtained by thermal treatment from an aqueous dispersion applied to a substrate, the dispersion containing a silicon/titanium mixed oxide powder prepared by flame hydrolysis and wherein said silicon/titanium mixed oxide powder is a mixture of powders comprising at least one powder having a BET surface area of at least 130 m²/g and at least one powder having a BET surface area of at most 90 m²/g, wherein the ratio by weight of the powders with a lower BET to the powders with a higher BET surface area is between 40:60 and 99.5:0.5.

22. (New) The layer as claimed in claim 21, wherein the thickness of the layer is between 100 nm and 1 mm.

23. (New) The layer as claimed in claim 21, wherein the thickness of the layer is between 1 pm and 50 μm.

24. (New) The layer as claimed in claim 21, wherein the thickness of the layer is between 5 pm and 15 pm.

25. (New) The layer as claimed in claim 21, wherein the BET surface area of the powder is between 5 and 500 m²/g.

26. (New) The layer as claimed in claim 21, wherein said silicon/titanium mixed oxide powder is a mixture of powders comprising at least one powder having a BET surface area of at least 170 m²/g and at least one powder having a BET surface area of at most 70

m^2/g , wherein the ratio by weight of the powders with a lower BET to the powders with a higher BET surface area is between 40:60 and 99.5:0.5.

27. (New) The layer as claimed in claim 21, wherein the titanium dioxide content of the powder is between 0.1 and 99.9 wt.%.

28. (New) The layer as claimed in claim 21, wherein the titanium dioxide content of the powder is between 2 and 20 wt.%.

29. (New) The layer as claimed in claim 21, wherein the substrate is selected from the group consisting of borosilicate glass, silica glass, glass ceramic, and a material with a very low coefficient of expansion.

30. (New) The layer as claimed in claim 21, further comprising less than 0.5 wt.% of impurities.

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31. (New) A process for preparing the layer as claimed in claim 21, comprising applying a dispersion containing a silicon/titanium mixed oxide powder to a substrate, and thermal treatment sintering the dispersion applied to the substrate.

32. (New) The process as claimed in claim 31, further comprising preparing the dispersion by flame hydrolyzing a silicon/titanium mixed oxide powder, wherein the proportion of powder is between 0.1 and 60 wt.% in the dispersion.

33. (New) A method comprising coating a material with a layer as claimed in claim 21, wherein said material is selected from the group consisting of an ultra-low expansion material a photocatalytic material, a self-cleaning mirror, a superhydrophilic constituent, a lens, a container for a gas and a container for a liquid.
